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THE WAR DEPARTMENT

FIGHTING VEHICLES RESEARCH AND DEVELOPMENT ESTABLISHMENT

REPORT No. F.T. 2239.

MINE DAMAGED TRACKS.

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Chobham Lane,
Chertsey,
Surrey.

Aug. 1944

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GRD-AS-K 15 October 1964

SUBJECT: Transmittal of Documents

TO: Commanding Officer
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Transmitted herewith for your information and retention is one copy of FVRDE Report FT 2239 "Mine Damaged Tracks".

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FIGHTING VEHICLES RESEARCH AND DEVELOPMENT ESTABLISHMENT

COPY NO: 20 PROJECT NO: G39/RG/97E

FILE NO: FVM 47/01, FVM 5/012 REPORT NO: FT 2239

RUNNING GEAR BRANCH COVER SHEET

TO

DEVELOPMENT TRIALS 'A' VEHICLES REPORT

ON

MINE DAMAGED TRACK

1. ORIGIN

Trials simulating mine attack on light vehicle tracks were carried out by R.A.R.D.E. This report covers F.V.R.D.E. trials with sections of the mined track, which were damaged but not severed, to establish 'kill' criteria.

2. COMMENTS

2.1 The mine trials were carried out at P. and E.E., Shoeburyness and are covered by report No. SXR/457/01. The track used was FV 420 vehicle pattern Dry Pin Steel Narrow wheel path assembly No. FV 337635 as being typical of the track used on light vehicles. Sections of 7 or 8 links were received with the actual damaged areas approximately in the middle of the sections.

2.2 Guide horn misalignment due to the damage was apparent in all sections but in only one case, section 17, was difficulty experienced in mating the damaged section with the remainder of the track.

2.3 For convenience in describing the damage reference is made, in report SXR/457/01, to the number of shear planes remaining intact after the mine attack. These planes are considered to be parallel and in line with the track containing the edges of the lugs across the pin joints. Section 17 is an example of extensive damage and had two shear planes left through which the driving load was carried.

2.4 The running course shown in Fig.6 was arbitrarily chosen as being typical of the type of cross country over which the vehicle was likely to encounter a mine field. After attack, if not immediately disabled, the vehicle would have to move, unaided, to a cleared area to enable the crew to carry out repairs. The length of the course was considered adequate for this purpose and if the damaged track prevented this movement the attack was considered a 'kill'. This trial satisfactorily demonstrated the ability of light track to continue running after sustaining considerable mine damage.

3. CONCLUSIONS

3.1 In each test carried out the vehicle completed the course satisfactorily. Additional deformation under the driving tension occurred at the damaged area with section 17 but this did not noticeably worsen running capability. No 'kill' was recorded with any of the sections.

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3.2. For this light track assembly No. FV.337635 the following design criteria were determined based on the arbitrary conditions given in 2.4.

3.2.1. When track is not severed beyond section 'AA' indicated in the figure attached to this cover sheet No 'kill' will be recorded.

3.2.2. When the track is severed beyond section 'AA' the section of links will be subjected to a vehicle running trial similar to that described in this report. If the track is thrown or is broken at the damaged section a 'kill' will be recorded.

3.2.3. If the damage is less than in 3.2.2. and longitudinal misalignment of the track is less than 2in over a total length of 5 pitches on either side of the damaged area No 'kill' will be recorded.

3.2.4. If the damage is less than in 3.2.2. and the misalignment is greater than 2in over 10 pitches as described in 3.2.3. the damaged section of links will be fitted to a vehicle and if the vehicle when run over the course in figure 6, is immobilised for any reason associated with the suspension, a 'kill' will be recorded.

4. FURTHER ACTION

Vehicle tracks of different design will be subjected to field trials, as required, after mine attack to establish 'kill' criteria.

G.V. Cleare.

(G.V. Cleare)
Assistant Director
(Running Gear)

(C. Dunbar)
Director

F.V.R.D.E. (Ascot 1160)
Chobham Lane, Chertsey,
Surrey.
31st August, 1964.
3193/64/CD

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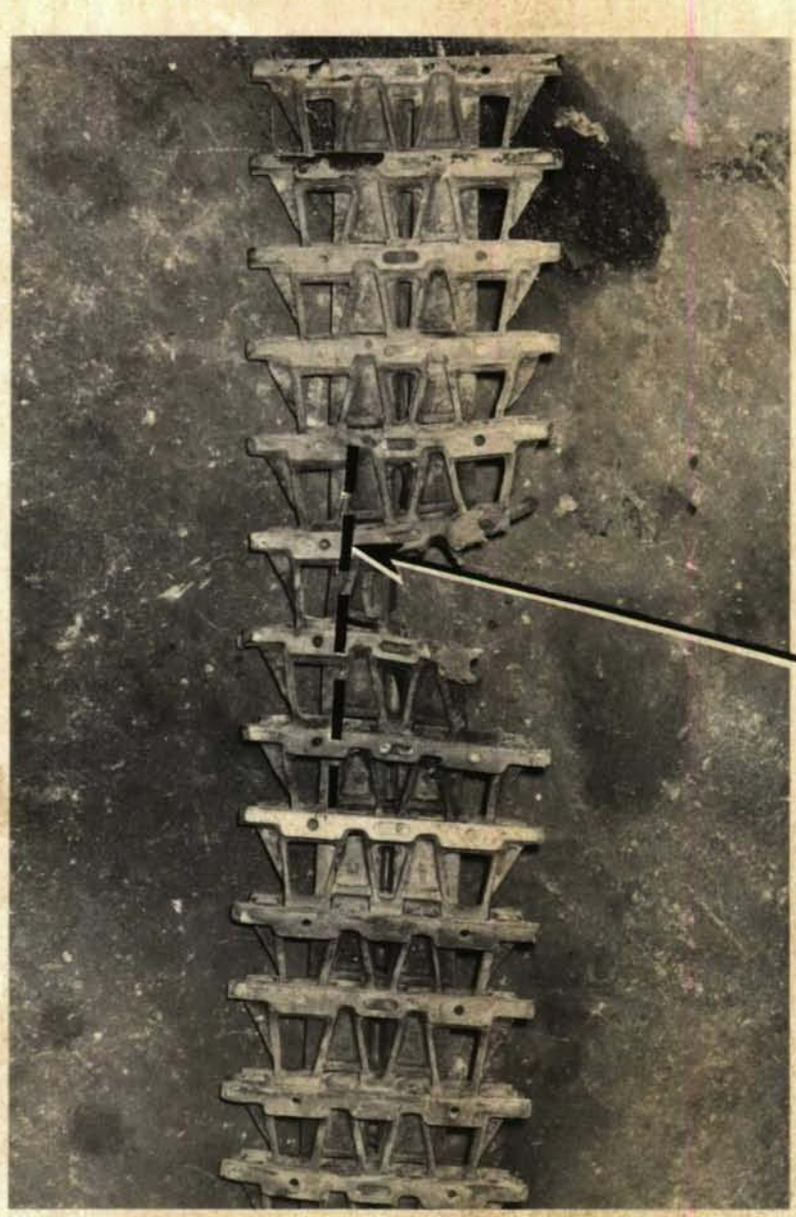

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Report No. FT2239

FIGHTING VEHICLES RESEARCH AND DEVELOPMENT ESTABLISHMENT

Development Trials 'A' Vehicles Report

on

Mine Damaged Tracks

1. Introduction

Ten sections of dry pin metal tracks were received at F.V.R.D.E. after being subjected to mine damage at R.A.R.D.E. These sections were fitted in turn into the track of a tracked load carrier (FV.421) in order to determine whether the vehicle would run a reasonable distance with the tracks in this condition.

2. Reference

Project No. G39/RG 97E Serial No. 14823

R.A.R.D.E. Report No. SXR/457/01

3. Equipment

3.1 Vehicle, FV.421 Reg. No. OOCA 25.

This tracked load carrier was weighted to 13 tons 16 cwt. Track guards were fitted without valences.

3.2 Track Sections. Ten sections of dry pin metal tracks, as received from R.A.R.D.E. are shewn in Fig. 1-3. These sections were each identified by the number painted on them by R.A.R.D.E. (Ref. report SXR/457/01). Drawing No. of link FV.351283.

4. Aim

To determine whether the vehicle could have been driven a reasonable distance after the tracks had been damaged by mines.

5. Method

5.1 The track sections were photographed and then fitted in turn to the vehicle. The damaged side was always fitted facing towards the centre of the vehicle with the spud trailing.

5.2 After fitting a section the vehicle was moved to give the track one complete traverse. This was done to confirm that the damaged portions would pass over the suspension components. The short cross country course shewn in Figs. 4, 5, and 6 was then used, the vehicle was accelerated through the gears along the straight, slowed down for a steered turn and then returned to the starting point. A skid turn on concrete completed the test circuit which brought the vehicle into position for the next section of track to be fitted.

5.3 The trial was carried out in [redacted] October, [redacted] The weather was dry but rain had fallen (prior to the test) and the ground was wet. The selected course was on sandy soil.

6. Results

See table at Annex A

6.1 The condition of the track sections after removal is shown at (Fig. 7-9).

7. Observations

7.1 The course was level, easy going and considered to represent normal light cross country.

7.2 The horns bent by mine blast tended to foul the road wheels and it was evident that consequential damage to components would be caused by prolonged running.

7.3 The sprocket engagement holes damaged by the mine blast caused the track to ride up on the sprocket teeth and resulted in very rough running. Where damage across the track was extensive there was some slight tendency for the links to open under driving tension. However this did not affect running with the loadings sustained in this trial.

7.4 No instance of track shedding occurred during the trial.

8. The Officer i/c of Trial was - Major R. W. E. Day R.E.

(Capt. J. M. Barrington)
Officer i/c A.2 Section

(R. F. Tipper) Colonel
Development Trials 'A' Vehicles

F.V.R.D.E. (Ascot 1160)
Chobham Lane,
Chertsey,
Surrey.
22nd August, 1963.

ANNEX A to
REPORT NO: FT.2239

RESULTS OF TRIAL USING MINE DAMAGED TRACK

Recognition Number	Shear planes remaining	Tendency to foul final drive or suspension	Tendency to throw	Whether Vehicle could have been driven reasonable distance.	Remarks
4	4	Damaged horn fouls and lifts road-wheels, lifts on top rollers.	Tendency is small, track rides roughly over sprocket.	Yes	No tendency to break.
5	4	Damaged horn fouls roadwheels.	Tendency is fairly small, damaged section jumps sprocket teeth when reversing and steering.	Yes	No tendency to break.
6	3	None	None	Yes	No tendency to break.
7	3	Damaged horn fouls wheels and would damage wheel rubber..	Tendency is small, damaged section rides roughly over sprocket.	Yes	No tendency to break.
8	3	None	Damaged section rides very roughly and lifts high on sprocket.	Yes	No tendency to break.
13	3	Damaged horns foul and lift road-wheels.	Tendency is small, track rides very roughly over sprocket.	Yes	Considerable stretch but no tendency to break.
14	3	Damaged horns foul and lift road-wheels considerably. Damaged section slightly obstructs final drive housing.	Tendency is small, damaged section rides roughly over sprocket.	Yes	Considerable stretching was apparent but fracture was not expected. Running at speed was very rough.
16	3	None	None	Yes	Slight roughness over sprocket.
17	2	Damaged horns lift roadwheels.	Tendency is small, damaged section rides roughly over sprocket.	Yes	Considerable stretch but no tendency to break.
18	3	Damaged horns lift roadwheels.	Tendency is small, damaged section rides roughly over sprocket.	Yes	Considerable stretch but no tendency to break.

MINE DAMAGED TRACK

FITTED TO FV.421, 00 CA 25, FOR TRIALS ON 17.10.62

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FIG. 1

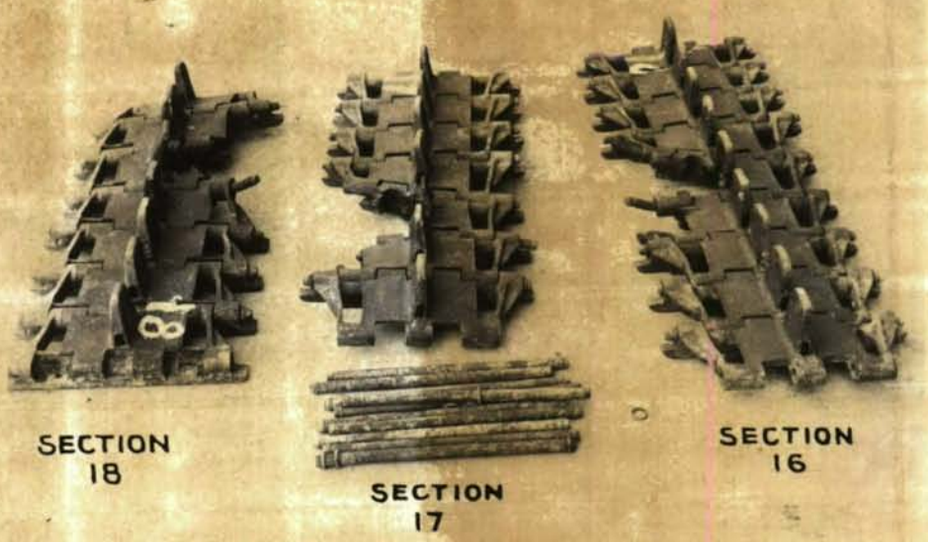

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FIG. 2

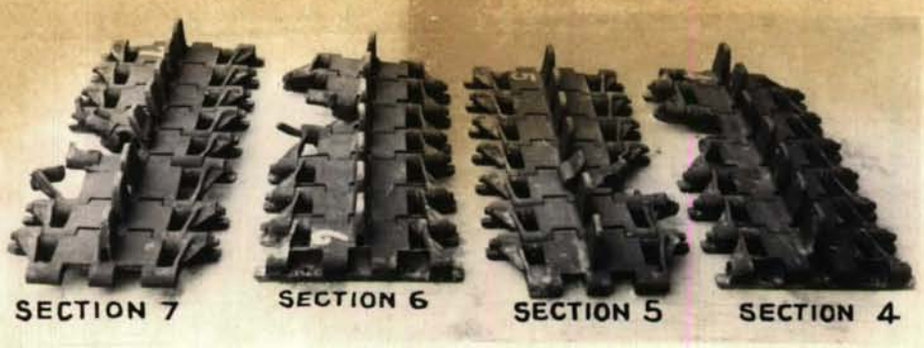

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FIG. 3

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FIG. 4

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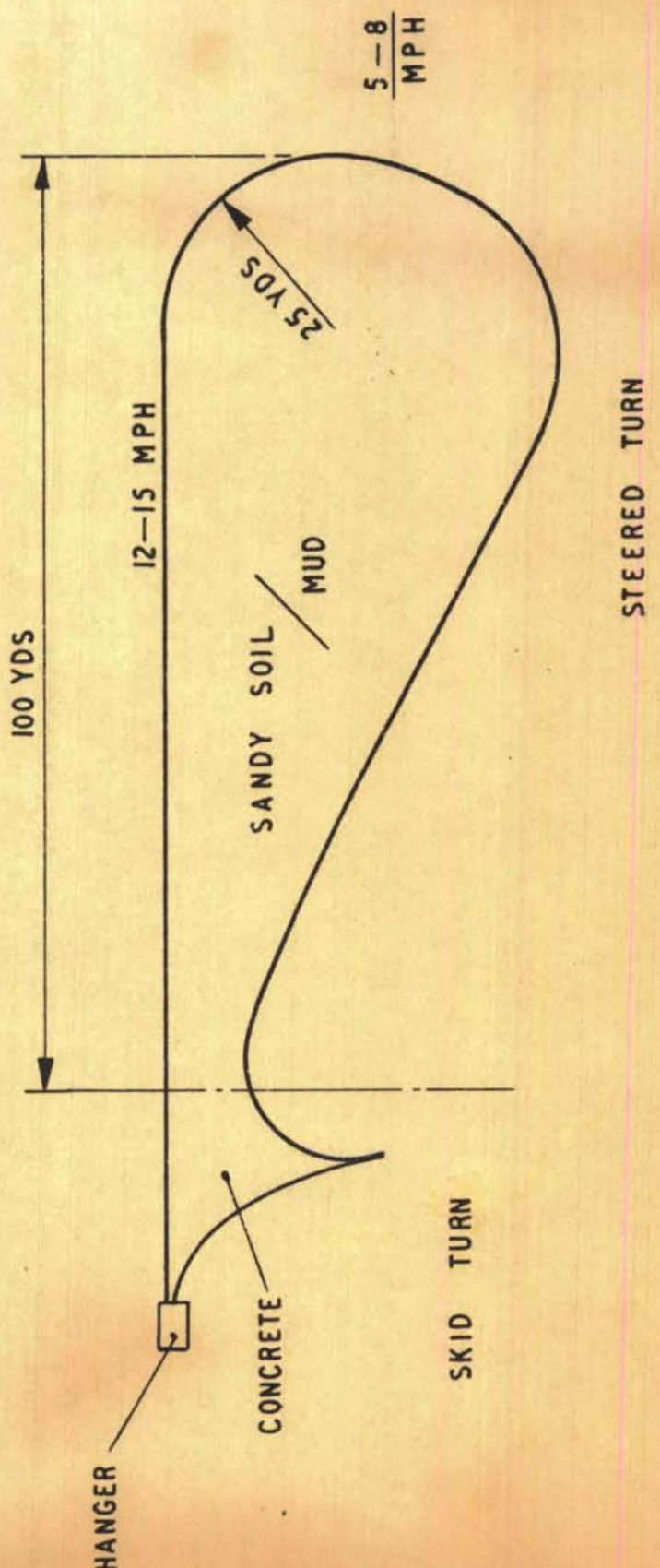
FIG. 5



TEST COURSE AT LONG VALLEY USED TO TRY OUT MINE DAMAGED TRACKS	REPORT N° FT. 2239
FIGHTING VEHICLES RESEARCH AND DEVELOPMENT ESTABLISHMENT.	FIG. N° 6

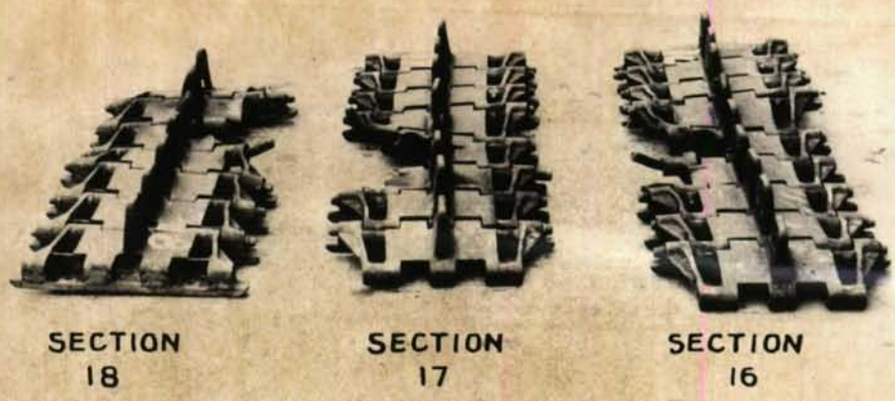


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FIG. 7

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FIG. 8

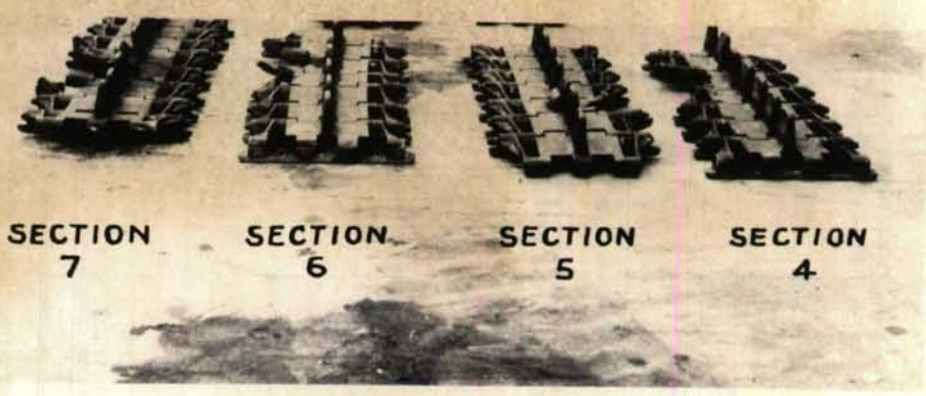

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FIG. 9